

A NEW GENUS, CARIBLATTA, OF THE GROUP BLATTELLITES (ORTHOPTERA, BLATTIDAE)

BY MORGAN HEBARD

Among the various well defined groups formerly treated under the generic name *Phyllodromia* Serville, (*Blattella* Caudell sens. lat.), we find one clearly marked, composed of diminutive species occurring in the West Indies, Trinidad, Panama and the southeastern United States. Certain of the species have been described under the generic name *Blatta*, these being later referred to *Phyllodromia*, as has been one synonymous name originally placed in *Theganopteryx* (*Pseudectobia*), while still another was described as, and has for quite a few years been erroneously considered, a member of the genus *Ceratinoptera*.

So little constructive work had been done in the classification of the group Blattellites, that the true relationship of these species only became apparent to us when extensive collections from the West Indies and Trinidad came into our hands for study.

With the material now in hand, we are able to assign this group, which we find it necessary to describe as a new genus, to its proper position, and we are also obliged to describe six species and one geographic race which were previously unknown or unrecognized.

CARIBLATTA¹ new genus

GENOTYPE.—*Cariblatia punctulata* [*Blatta punctulata*] (Beauvois).

This genus is a member of the group Blattellites, there forming one of the groups of species to which Shelford has hastily applied

¹ This name is chosen since the greater number of the forms of the present complex would appear to be found in the regions in which the Carib Indians were native.

the name *Neoblattella*.² In position it follows *Blattella* and comes before *Neoblattella* as here restricted.³

Generic Description.—Size small to very small, form moderately slender to distinctly slender for the group. Sexes showing but little difference in size or form. Head with eyes normally separated by distinctly more than their exceptional depth, this slightly more pronounced in the female sex; the entire contour of face convex, the area between the eyes and between the ocellar spots (in some genera of the group decidedly flattened) very weakly defined, weakly flattened; below this the face is somewhat pinched and transversely convex mesad, the remaining lower portions weakly transversely convex, the lateral margins below the eyes slightly convergent ventrad (in *Neoblattella* these margins are in most cases more nearly parallel, the face in consequence being proportionately slightly broader at the clypeal suture). Maxillary palpi with first two joints mere knobs, third and fourth joints very long and slender, fifth (distal) joint distinctly shorter than fourth joint, distinctly enlarged and obliquely truncate to near its base. Pronotum with dorsal surface weakly convex; cephalic margin narrower and less distinctly truncate than caudal margin; lateral margins convex; point of greatest width meso-caudad. Disk of pronotum rotundato-octagonal with angles blunted; remaining marginal portions transparent, these broad laterad. Abdomen of males with dorsum not strikingly specialized. Tegmina, in normal fully developed condition (changes due to reduction occur in tegmina and wings

² Ent. Month. Mag., 2d ser. xxii, p. 155, (1911).

³ We here restrict the genus *Neoblattella* to the forms more closely agreeing with the genotype, *N. adspersicollis* (Stål). These differ from the species of *Cariblatia* in size, which is medium small to large; proportionately wider head at clypeal suture; number of longitudinal discoidal sectors of the tegmina, which are normally always more than five (this count including the median vein, all its branches and the ulnar vein), and three or more spines on the ventro-caudal margin of the cephalic femora (not counting the distal spine). Closely related, these two genera in a way are comparable with the genera *Orchelimum* and *Conocephalus* in that they form two definite and easily recognized units which, however, are most difficult to diagnose in that they "differ not in one or several invariable characters, but instead may be distinguished by combinations of characters and a general complex not found in the other genus." All of the species of the present genus are decidedly smaller than the smallest species of *Neoblattella*, which species, *N. fratercula*, Hebard (Ent. News, xxvii, p. 159, (1916)) shows the closest approach in that genus to the present complex, as here *C. insularis* does to that genus.

in *C. lutea* as discussed under that species), moderately broad with costal and sutural margins straight and in greater part sub-parallel; scapular area very broad; discoidal sectors (except in *insularis* and possibly in *punctipennis*) normally five in number (this including the median vein and its branches and the ulnar vein); diagonal channel of dextral tegmen (diagonal vein of authors) pronounced in anal field, extending to discoidal vein and occasionally traceable beyond among the costal veins; portion of dextral tegmen, which is concealed when at rest, less suffused and with cross-veinlets more distinct than in other portions of the organ. Wings weakly to distinctly iridescent (except in *imitans*); a number of costal veins strongly and briefly clubbed distad; ulnar and axillary vein branched; intercalated triangle small but evident. Supra-anal plate in both sexes very small and strongly transverse. Cerci elongate, flattened; with lateral margin of each segment narrowly deplanate and with this margin weakly convex in lateral outline; segments normally ten in number and well defined, the last three decreasing rapidly in size, the last segment being minute and cylindrical. Subgenital plate of males moderately large, in the majority of species symmetrical but in some very strongly asymmetrical. Subgenital plate of females very large, decidedly produced mesad. Cephalic femora slender with ventro-cephalic margin supplied proximad with (usually four) long, widely spaced spines the more distal shortest, succeeded distad by a more closely set row of shorter spines terminated by two long spines; ventro-caudal margin with two widely spaced long spines meso-distad and a single long distal spine. Other femora supplied distad with a long dorsal spine and single shorter distal spines on each of the ventral margins, which margins are further supplied with a few long spines. Moderately well developed arolia present.

Generic Distribution.—The genus is known from the southeastern United States, the Bahamas, Greater Antilles, Little Cayman Island, Antigua, Dominica, Barbados, Trinidad and Panama. It is not represented in large series of material before us from continental tropical North America north of Panama.

Environmental Notes.—In the southeastern United States we have found *C. lutea* widely distributed among the dead leaves, pine needles and grasses in the forest, and also in the open under

debris of every kind. The tropical species of the present genus found by the author, in most cases inhabited preferably the heavy forest, where numbers were discovered among the loose leaves resting on the leaf mould on the ground, in dead agaves and in the bromeliads on the branches of the trees. Of the material collected, it is interesting to note that *C. insularis* was found to be the most numerous Orthopterous insect in the bromeliads growing on the branches of the trees at Montego Bay, Jamaica. In an area of a few feet of leaves and leaf mould in the hillside forest at Stony Hill, Jamaica, which was minutely examined, series of *C. reticulosa* and *C. cuprea* and a number of specimens of *C. punctulata* were secured; these species of the present genus forming a large proportion of the Orthopteran life there found. These diminutive insects ran about with great speed and took wing readily, though usually flying but short distances. When in flight, they appeared very much like small brownish moths. The series of *C. imilans* was secured at Corozal, Panama, also in the dead dry leaves and leaf mould of the jungle. Material of *C. punctulata*, however, was secured both in Cuba and Jamaica, under various rubbish in fields of short grass, the species appearing to be widely distributed in the open as well as in the forest.

Structural Characters.—The species are decidedly similar in many structural features. Slight size variation is found within individual species (except in *punctulata* and *lutea*), but all of the species show only slight differences from each other in this feature. In form the species are constant, and appreciable differences in this character are found between some. The head is the same throughout the genus, the maxillary palpi alone showing slightly different degrees of attenuation in different species, but in occasional individuals these appendages are deformed, on one side or both, and the character is in consequence dangerous to rely upon when determining single specimens. The male genitalia, but particularly the subgenital plate and its appendages, furnish strikingly different characters in the majority of the species and show hardly any variation, (only in *punctulata* are distinct individual differences found as discussed on p. 160, footnote 16). The female genitalia offer much less striking differences; in but a few species showing slight differences, in the degree of mesal emargination of the supra-anal plate and of the production of

the subgenital plate, which appear to be of diagnostic value. The limbs and armament of the same are not variable and agree in all the species.

Color Characters.—In the species of the genus, the coloration is decidedly constant, minor differences are found due wholly to recession and intensification (in *punctulata* alone such differences being in some series very decided). The head markings, though showing a similar type in many species, show features of real diagnostic importance in several and of marked distinction in two, *craticula* and *insularis*. This is likewise true for the pronotal markings, the most distinctive species in this respect being *reticulosa*. The tegmina and wings show very slight differences for the majority of species, but in two, *punctipennis* and *insularis*, show striking features of excellent diagnostic value. The markings of the ventral surface of the abdomen are also diagnostically useful in some species, but recession and intensification appears to be particularly marked in these features and in consequence, in several species normally well marked, these markings are occasionally found unusually pronounced or entirely absent.

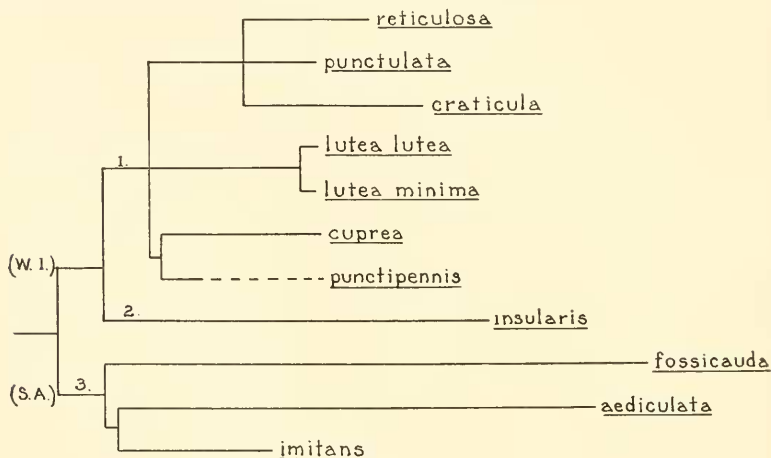
Tegminal Venation.—The number of longitudinal discoidal sectors is, in the normal fully developed condition (under *lutca* are discussed the various differences there found, due to reduction in tegmina and wings), normally five⁴ in the majority of the species; variation sometimes occurs and we have examples of *punctulata* showing but four of these sectors, while the few examples of *punctipennis* show five, six or seven and *insularis* shows the same range, the number being less often five than otherwise.

Wing Venation.—The wings show few and usually unimportant specific diagnostic features. The degree of iridescence and coloration of the veins and particularly of the distal cross veinlets are of some importance in separating certain species and appear to show little variation. The ulnar vein shows in the majority of species normally two distinct rami, but in a number of species as many as four rami occur, two of these usually being decidedly

⁴ In *Neoblattella*, the great majority of the species show more of these sectors. In considerable series before us, we find in the species of the *adpersicollis* (genotype) complex an average of ten, in the *deversa* complex eight, while in the complex showing nearest approach to the present genus we find *brunncranea* with five to seven and *fratercula* six. As the number of veins increase, greater variation in their number appears to occur.

distal in position; individual variation is so great that in specific diagnoses this feature is best omitted. The same is true for the axillary vein; in addition to a number of the free veins of the axillary field, which frequently spring from this vein near its base, it is found to have three, very rarely four, rami; the rami spring from the vein normally caudad, very rarely cephalad and sometimes both divisions of the rami diverge equally, or one of the rami itself again divides.

Specific Groups.—The relationship of the forms of the present genus can be best expressed diagrammatically as shown below.



The genus divides into three distinct groups, of which the first and second may be termed the West Indian complex and the third the South American. The West Indian complex, excepting the single species of group two, shows the ulnar vein of the wings with but one or two conspicuous rami, though other rami may occur distad; all have more or less distinctive features of coloration; *reticulosa*, *punctulata*, *craticula* and *insularis* are the more slender forms. The second group includes the single species, *insularis*; distinctive in general appearance, in the unusual pronotal marking, in the tegminal markings and in the remarkable male genitalia. The ulnar vein of the wings has more than one or two conspicuous rami. The South American forms, excepting *fossicauda*, have the ulnar vein of the wings with several rami; all are inconspicuously colored; none are as slender as *punctulata*.

The male subgenital plate shows a most remarkable diversity in its development; the species *reticulosa*, *insularis*, *fossicauda*, *aediculata* and *imitans* each showing an utterly different type.

*Key to Males of the Species Based Primarily on Genital Characters*⁵

- A. Subgenital plate symmetrical.
- B. Subgenital plate with two appendages (styles).
- C. Styles specialized.
 - D. Styles represented by rounded knobs with dorsal surface thickly covered with minute chitinous spines.
 - E. Tegmina and wings fully developed.⁶
 - F. Subgenital plate moderately produced. Styles separated by a broad space.
 - G. Pronotum and tegmina with heavy lateral bands of dark brown. (Form decidedly slender. Median portion of distal margin of subgenital plate scarcely produced.)

reticulosa (Walker)
 - GG. Pronotum and tegmina without lateral bands.
 - H. Disk of pronotum buffy with an olive tinge, normally finely pitted. Form rather slender. (Median portion of distal margin of subgenital plate variable but never elongate attenuate produced.)

punctulata (Beauvois)
 - HH. Disk of pronotum ochraceous tawny, immaculate except for two dark dots. Form less slender. (Median portion of distal margin of subgenital plate scarcely produced.)

cuprea new species
 - FF. Subgenital plate decidedly produced (median portion of distal margin very elongate attenuate produced). Styles separated by a very narrow space.

craticula new species
- EE. Tegmina and wings not fully developed (accompanied by a distinct broadening of the pronotum and a lessening in the convexity of the caudal margin of the same⁷).

⁵ Other features are given only where the genitalia are of similar type and do not afford sufficient differences to separate readily certain of the species. As the male of *punctipennis* is unknown, that species is omitted from the present key.

⁶ Slight reduction is found in a single female specimen of *punctulata* from the Bahamas. The tegmina and wings in this specimen reach only 1 mm. beyond the apex of the supra-anal plate. In no female of the large series of the species of the alternate category, *lutea*, do the tegmina extend beyond the apex of the supra-anal plate.

⁷ This interesting feature is discussed on page 166, footnote 23.

F. Median portion of distal margin of subgenital plate very broadly rectangulate produced. Tegmina and wings normally moderately reduced.⁸ Average size larger.⁹

lutea lutea (Saussure and Zehntner)

FF. Median portion of distal margin of subgenital plate small, subquadrate, very slightly longer than wide. Tegmina decidedly reduced, wings vestigial. Average size smaller.

lutea minima new subspecies

DD. Sinistral style represented by a curved chitinous spine; dextral style a rounded knob with dorsal surface thickly covered with minute chitinous hairs. (Distal margin of subgenital plate very strongly raised laterad with styles set very deeply within the cleft between lateral portions and median portion, which later projects outward with truncate distal margin raised.)

insularis (Walker)

CC. Styles simple. (Distal margin of subgenital plate but little raised laterad, briefly notched at base of styles.)

imitans new species

BB. Subgenital plate with four appendages (simple styles and accessory knobs with dorsal surface covered with minute chitinous spines, these situated at base of cerci). (Subgenital plate with very broad median portion of distal margin having acute-angulate divergent projections.)

aediculata new species

AA. Subgenital plate strongly asymmetrical (sinistral strongly but narrowly produced with lateral margins parallel and ventral surface transversely convex; adjacent dextral is a similar decidedly shorter projection with margins convergent; within these projections are concealed greatly specialized styles, sinistral a thin circular disk with free margin clothed with microscopic chitinous spines, dextral a rounded knob with dorsal surface supplied with minute chitinous spines).

fossicauda new species

Key to the Species Based on Diagnostic Characters of Coloration

Many features of coloration and particularly of color pattern, serve in the present group to distinguish readily many of the species. Use of such characters in the study of material can only lead to mistakes, unless the effect of recession and intensification in the color pattern and coloration is thoroughly understood.

⁸ In the female the tegmina and wings are normally more decidedly reduced, while in that sex the wings are found to be vestigial in occasional specimens from the southeastern portion of the distribution of typical *lutea*. In addition, the female is found to average slightly larger and more robust than the male; these features result in a greater contrast between the sexes in typical *lutea*, and to a lesser degree in *lutea minima*, than in any other species of the genus.

⁹ Nearest relationship is found to *punctulata*. In addition to the features here given, we would add that the buffy general coloration in *lutea* is always more or less tinged with cinnamon, while the buffy coloration in *punctulata* is instead tinged to varying degrees with olivaceous.

Thus in every species, but particularly in those normally showing weak or very delicate markings, individuals of the maximum recessive condition will show faintly, or wholly lack, features usually recognizable with the greatest ease and which, when present, are frequently of real diagnostic value. Similarly, in the maximum of intensification, the darker and increased size of the markings often give such examples an extraordinary appearance. A goodly number of synonymic names are based upon just such misconceptions of the intra-specific range of coloration, but such mistakes need not occur in future and many characters of coloration and particularly of color pattern, will be found distinctly useful if the conditions discussed above are taken into consideration.

A. Tegmina without distinct dots.

B. Various distinctive features of color pattern or coloration present, ventral surface of abdomen frequently variously maculate.

C. Tegmina distinctively marked.

D. Tegmina with heavy elongate suffused band of mummy brown from base of discoidal vein to about two-thirds the distance to its apex. Pronotum with heavy paired blackish brown bands expanding and diverging slightly caudad, running from cephalic margin to caudal margin of pronotum through lateral borders of disk. Head with normal markings.¹⁰

reticulosa (Walker)

DD. Tegmina with two small elongate maculations of bistre, one at base of anal vein and one slightly distad of this point on discoidal vein. Pronotal markings of normal type, disk finely pictured. Head with distinctive markings.

insularis (Walker)

CC. Tegmina immaculate, or weakly marked (only in intensive phases of *punctulata*).

D. General color of disk of pronotum buffy, very finely pictured, this picturing normally strongly defined.

E. Head with markings variable (see pages 161 and 167), transverse bands when present on face always concave.

F. Buffy general coloration always tinged to varying degrees with olivaceous.

punctulata (Beauvois)

FF. Buffy general coloration always tinged to varying degrees with cinnamon.

lutea lutea (Saussure and Zehntner)

lutea minima new subspecies

¹⁰ We term the character of cephalic markings found in this species normal, as this condition is found in *reticulosa*, *fossicauda* and *aediculata*, in the intensive condition of *punctulata* and weakly suggested in *cuprea*. A broad band ventrad between the eyes, a narrower concave band between the ocellar spots and below on the face two still narrower, sometimes mesally interrupted, concave bands.

EE. Head with distinct transverse bands on face narrow and always straight.

craticula new species

DD. General color of disk of pronotum ochraceous tawny, immaculate except for two rather widely separated dark dots. (Head very obscurely marked.)

cuprea new species

BB. Distinctive features of coloration and color pattern not present, except that ventral surface of abdomen has a proximo-median suffusion of dark brown. (General coloration uniform warm buff. Head showing normal markings weakly or distinctly defined—(see footnote 10). Disk of pronotum obscurely or very finely pictured.)

C. Normal markings of head distinct. Disk of pronotum very finely pictured. (Cross-veinlets of tegmina and wings moderately well defined in darker brown.)

D. Proximo-median suffusion of ventral surface of abdomen usually less extensive, in male sometimes almost disappearing.

fossicauda new species

DD. Proximo-median suffusion of ventral surface of abdomen usually conspicuous, in male often forming a suffused but extended medio-longitudinal dark band, in female often represented by an extensive dark blotch sometimes reaching as far as base of subgenital plate.

aediculata new species

CC. Normal markings of head weakly defined. Disk of pronotum obscurely pictured. (Cross-veinlets of tegmina and wings well defined in darker brown. Proximo-median suffusion of abdomen weakly indicated or subobsolete.)

imitans new species

AA. Tegmina with minute, scattered, distinct dots of dark brown. (Disk of pronotum buffy with a few or numerous slightly darker brown dots. Head immaculate or with very obscure suffusions of slightly darker shade.)

punctipennis new species

Specimens Examined.—The total number of specimens listed in the present paper is 333, of which 206 examples are in the Philadelphia collections. We wish to express our hearty thanks to Mr. Wm. T. Davis and to the curators of the collections of the United States National Museum, American Museum of Natural History, Museum of Comparative Zoology and Brooklyn Institute of Arts and Sciences, for the privilege of studying all of the material in those collections referable to the present genus.¹¹ We have been unable to examine the types of the four previously described species, but we have had before us series of topotypic specimens of each of these, which agree fully with the original descriptions.

¹¹ The material from Porto Rico, excepting those specimens from the National Museum, was secured in connection with the New York Academy-Porto Rico Survey. The first set of this material is in every case the property of the American Museum of Natural History.

Cariblatta reticulosa (Walker) (Pl. XI, fig. 1; Pl. XII, figs. 1 to 3.)
1868. *Blatta reticulosa* Walker, Cat. Blatt. Br. Mus., p. 103. [♂, Jamaica.]

This beautiful species is the most strikingly colored member of the genus. Nearest relationship is shown to *C. punctulata*, the present insect differing from that species mainly in the very distinctive color pattern and coloration. The genitalia of the two species are similar, showing only in the male subgenital plate slight differences of degree.

The following features are found in a pair from Stony Hill, Jamaica. ♂. Size small, form slender. Cross-veins between discoidal sectors of tegmina very heavy; in the area of the dextral tegmen which is concealed when at rest, being as pronounced as the sectors themselves. Supra-anal plate very small, strongly transverse, very weakly produced, with distal margin very broadly convex. Subgenital plate much as in *C. punctulata*, but with lateral portions not as much upturned and style sockets on distal margin less decided, represented by very weak nicks in the distal margin, these are also slightly more widely separated, the space between them transverse and representing a full third of the distal margin; styles as in *punctulata*.

♀. Agrees with male except in the following features. Supra-anal plate very small, strongly transverse, weakly produced with distal margin broadly convex. Subgenital plate large, scoop-shaped, as in *punctulata*.

Measurements (in millimeters)						
	Number of specimens	Length of body ¹²	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
♂						
Aibonito, Porto Rico. . (1)		8.6	2	2.7	9.7	2.7
Stony Hill, Jamaica. . . (2)		6.8-7.3	1.8-1.9	2.7-2.8	8.4-8.7	2.4-2.5
♀						
Stony Hill, Jamaica. . . (5)		7.6-7.8	1.9-2	2.7-2.8	8.4-8.7	2.3-2.4

Though this small series shows some size variation, the coloration is very constant.

¹² The body length of males and females of the present group is not wholly comparable; the female subgenital plate in the present genus is without exception distinctly more produced, this dimension consequently showing a greater difference in the sexes than is true for their relative size of body.

Coloration.—Head showing the normal color pattern, (see page 155, footnote 10); ocellar spots located in pale area and, in consequence, usually inconspicuous. Pronotum with lateral margins transparent with a very weak brownish suffusion; from the cephalic to the caudal margin run two blackish brown bands which, weakly diverging caudad, occupy the lateral margins of the disk, these bands briefly invade the mesal portion of the disk, which is clear light buff, immaculate except for a pair of exceedingly slender pencilled lines of dark brown. At the caudal margin of the disk the dark lateral bands spread out forming pyramids of that color, the apices of which are lost cephalad in the bands and the bases of which fuse mesad on the caudal margin. Tegmina transparent tinged with brownish; a heavy elongate suffused band of mummy brown extending from the base of the discoidal vein usually two-thirds the distance to its distal extremity; the entire area occupied by the discoidal sectors suffused with mummy brown, these sectors and the numerous cross-veinlets strongly defined in this color. Wings transparent with a dark suffusion, strongly iridescent; veins and cross-veinlets conspicuously dark brown, excepting area of enlarged portions of costal veins which is conspicuously buff. Limbs and underparts cinnamon buff, the abdomen slightly suffused mesad and laterad with brown, this suffusion shining blackish brown and more decided in the females, in that sex spreading out over the greater portion of the subgenital plate. The limbs at the bases of the heavier spines are usually heavily flecked with dark brown.

Specimens Examined: 8; 3 males, 5 females.

Aibonito, Porto Rico, VII, 14 to 17, 1914, (H. G. Barber), 1 ♂, [Am Mus. Nat. Hist.].

Stony Hill, St. Andrew Parish, Jamaica, X, 25, 1913, (Hebard; in leaves on leaf mould in hillside forest), 2 ♂, 5 ♀, [Hebard Cln.].

Cariblatia punctulata (Beauvois) (Pl. XI, figs. 2 and 3; Pl. XII, figs. 4 to 8; Pl. XIII, figs. 1 and 2.)

1805. *Blatta punctulata* Beauvois, Ins. Rec. Afr. Amer., p. 184, Orth. pl. 1b, fig. 8. [San Domingo.]

1857. *Blatta (Phyllodromia) delicatula* Guérin, in Ramon de la Sagra, Hist. Cuba, Ins., p. 346. [Cuba.]

It is not surprising that the present species was redescribed by Guérin, there appearing the most complete description of the

insect. The description of Beauvois is wholly superficial and his figure lacks all indication that it is enlarged, a feature explained by that author, who in his introduction states that all the specimens are drawn an inch long, lines giving the natural size being placed beside the enlarged figures, a feature omitted by accident on plate 1b. This has been noted and the synonymy first established by Rehn.¹³

The present species is apparently the most widely distributed of the genus. Nearest relationship is shown to *C. reticulosa*, though the general appearance of the present insect is far less distinctive.

The following features are as found in a pair from the San Francisco Mountains, San Domingo. ♂. Size small, form slender. As in the other species of the group, the eyes are normally separated by distinctly more than the ocular depth, this usually a little, occasionally about one third, less than the width between the antennal sockets (one large male from Mayaguez, P. R., shows excessive variation in having the interocular space scarcely more than half the ocular width). Cross-veinlets between discoidal sectors of tegmina numerous but inconspicuous. Supra-anal plate very small, strongly transverse, very weakly produced with distal margin very broadly convex. Concealed genitalia:¹⁴ sinistrad is situated a very thin spatulate chitinous projection, from the apex of which springs a very slender elongate chitinous process directed sinistro-caudad and then curving at its middle very sharply dextrad with immediate apex showing a minute bulb. Subgenital plate moderately produced, lateral portions raised, weakly convex to mesal fourth of distal margin, the lateral margins each comprehending about three-eighths of the total margin and terminated on each side by a brief concavity, in which emargination is situated a small rounded knob, slightly longer than wide, with dorsal surface heavily

¹³ Bull. Amer. Mus. Nat. Hist., xxii, p. 109, (1906).

¹⁴ We have been unable to consider fully the concealed male genitalia for the species of the present genus, as the insects are so small and delicate and in many cases represented in collections by so few specimens that it would often be impossible to examine these parts without destroying important material. In many groups these features are of the utmost importance in distinguishing species which might be easily confused, but in the present complex the species can be satisfactorily determined without this aid.

clothed with minute chitinous spines directed inward;¹⁵ between these specialized styles the median portion, slightly less than a third of the distal margin, is straight or weakly produced.¹⁶

♀. Agrees with the male except in the following features. Form very slightly less slender. Supra-anal plate very small, strongly transverse, weakly produced with distal margin broadly convex but showing a short though marked median concavity. Subgenital plate large, scoop-shaped, distal margin proximo-laterad distinctly convex, then weakly and broadly concave at base of cercus, thence weakly convex to the rather decidedly produced apex, the margin of which is broadly rounded but the plate at this point slightly pinched.

Measurements (in millimeters)

♂	Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
Cayamas, Cuba	(4)	6.6-7.8	1.7-1.9	2.4-2.5	7.4-8.6	2.1-2.4
San Francisco Mts., San Domingo	(6)	7-7.8	1.8-2	2.6-2.7	8-8.9	2.3-2.6
Rio Piedras, Porto Rico (1)	7	7	1.8	2.4	7.4	2
Mayaguez, Porto Rico (2)	7.6-8.1	2-2.1	2.7-2.8	7.2-8.9	2.3-2.7	
Stony Hill, Jamaica . . . (1)	7.3	1.9	2.4	8	2.3	
Montego Bay, Jamaica (6)	7.4-7.6	1.8-1.9	2.3-2.4	7.2-7.4	2.1-2.2	

¹⁵ A single male in this series, typical in other respects, has a large proportion of these spines apparently fused into one much longer and stouter spine. This condition may indicate the manner in which the extraordinary sinistral style in *C. insularis* has been evolved.

¹⁶ In the series from San Domingo this is perfectly transverse; those from Hayti and Cuba have it more or less asymmetrical and weakly produced to varying degrees; in those from Jamaica it is more produced, constituting a brief truncate lobe, while in the males from Porto Rico, those from Mayaguez, Adjuntas and Coamo have a minute median production longer than wide, the one from Mayaguez has the median space narrower but the production larger, while those from Manati and Rio Piedras have the median portion of the plate very unusually asymmetrical, large and decidedly projecting, terminating in an acute dextral apex. From this evidence it is clear that frequently variation in this feature occurs in the present species, apparently partially geographic in character but showing much too great instability to afford grounds for nominal recognition of any sort.

♀	Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
Nassau, Bahamas	(2)	6.6-8.6	2-2.3	2.7-3.2	6.4-9	2.2-2.8
Cayamas, Cuba	(3)	7.7-8.2	2-2.1	2.7-3	7.9-9.3	2.4-2.8
Little Cayman Island . .	(3)	8.1-8.2	1.9-2.1	2.6-2.8	7.8-8.3	2.3-2.6
San Francisco Mts., San Domingo	(11)	7.3-7.7	1.9-2.2	2.6-3	8.3-8.6	2.4-2.7
Stony Hill, Jamaica . . .	(3)	7.7-8.6	1.9-2	2.7-2.9	8.6-8.9	2.3-2.4
Montego Bay, Jamaica (1)		6.8	1.9	2.6	6.7	2.2

This series indicates clearly that the size variation in the species, sometimes particularly pronounced in the organs of flight, is due rather to local environmental conditions than to geographic distribution.

The species shows greater variation than is usual in the species of the present genus, particularly in size, interocular width and in certain features of the genitalia of both sexes. It would seem that very frequently in the Orthoptera, the apparently most widely distributed and most abundant species in a genus shows the greatest variability in that complex, as we find to be true in the present case.

Ootheca.—From a female from Montego Bay, Jamaica, with ootheca projecting, it is evident that this is carried with suture dorsad. Other oothecae of the species from Cayamas, Cuba, are 5.3 to 5.8 mm. in length, by 2.4 mm. in width; the dorsal and ventral margins are parallel and very slightly curved, the dorsal (suture) being slightly convex with numerous regularly placed minute knob-like projections; the extremities are both slightly concave and weakly produced dorsad, this somewhat greater at the proximal extremity. From one of these oothecae has emerged a Hymenopterous parasite, identified as *Hyptia* sp., by Ashmead.

Coloration.—Head cinnamon buff with a broad transverse band of bister ventrad between the eyes, ocellar spots normally located in a pale area and, in consequence, inconspicuous; below, the face is sometimes immaculate, sometimes a few flecks of darker color are apparent, while in individuals of the maximum intensive coloration three nearly equidistant, distinct, narrow and weakly concave transverse bands of the darker color are found: in some Porto Rican specimens of great intensive color-

tion dark markings occur dorsad on the vertex and dark blotches break the dorsal facial bands, of which the dorsal is the widest; while in one from San Domingo, a condition somewhat resembling the normal type in *C. insularis* is found. Pronotum with lateral margins transparent with a very weak brownish suffusion; disk buffy washed with saccardo's umber with a very fine picturing of bister.¹⁷ Tegmina transparent tinged with brownish, the veins translucent saccardo's umber.¹⁸ The dorsal portions of the insect, as a result, appearing diaphanous but in general shaded with saccardo's umber. Wings transparent, hyaline, moderately iridescent; veins translucent brownish. Abdomen clay color below, with a broad medio-longitudinal band and on each side a narrower submarginal band of blackish brown, which bands extend only to the base of the subgenital plate.¹⁹ Limbs cinnamon buff, frequently flecked at the bases of the heavier spines with dark brown.

Specimens Examined: 68; 31 males, 34 females and 3 immature specimens.

Nassau, New Providence Island, Bahamas, (G. P. Englehardt), 2 ♀, [Bklyn. Inst. and Hebard Cln.].

Cabañas, Pinar del Rio, Cuba, V, 18, (Palmer and Riley), 1 ♂, 1 ♀, [U. S. N. M.].

Pinar del Rio, Pinar del Rio, Cuba, IX, 9 to 24, 1913, (F. E. Lutz; at light), 1 ♀, [Am. Mus. Nat. Hist.].

Cabañas, Havana, Cuba, I, 29, 1904, (Hebard; debris in short grasses in open), 1 ♂, [A. N. S. P.].

Jesús del Monte, Havana, Cuba, I, 23, 1904, (Hebard; debris in short grasses in open), 2 ♂, [Hebard Cln.].

Cayamas, Oriente, Cuba, III, 2 to XII, 23, (E. A. Schwarz), 4 ♂, 3 ♀, [U. S. N. M. and Hebard Cln.].

¹⁷ Specimens in the maximum recessive coloration show only traces of these markings. In the series before us every gradation from this condition to the maximum of intensive coloration, in which the picturing is very strongly and sharply defined, is found. In the material from Hayti and Little Cayman Island and numerous specimens from Cuba and Jamaica, distinctly recessive coloration is shown, the maximum of this being found in a few Cuban specimens. The series from San Domingo and Porto Rico average rather intensive in coloration. These differences would appear to be due wholly to local environmental conditions.

¹⁸ Occasional individuals have the anal vein of the tegmina slightly suffused with a darker brown, while in a few specimens from Cuba the tegmina have a few microscopic dots, very much smaller but of the same character as those found in *C. punctipennis* (see p. 174).

¹⁹ In specimens of recessive coloration, the median band is no wider than the submarginal bands; in some females of intensive coloration, the subgenital plate is heavily marked mesad with blackish brown.

Little Cayman Island, III to IV, 1888, 3 ♀, [M. C. Z. and Hebard Cln.].

Hayti, (P. R. Uhler), 2 ♂, [M. C. Z.].

San Lorenzo, San Domingo, VI, 27 to 29, 1915, (F. E. Watson; at night on royal and cocoanut palms), 1 ♂, 1 ♀, [Am. Mus. Nat. Hist.].

San Francisco Mountains, San Domingo, IX, 1905, (A. Busek), 6 ♂, 12 ♀, [U. S. N. M.].

Sanchez, San Domingo, VI, 7 to 12, 1915, (F. E. Watson), 1 ♀, [Am. Mus. Nat. Hist.].

Mayaguez, Porto Rico, I, 1899, (A. Busek), 1 ♀, [U. S. N. M.]; VI, 21 to 23, 1915, (Lutz and Mutehler; at light), 1 ♂, [Am. Mus. Nat. Hist.].

Adjuntas, Aguadilla, Porto Rico, VI, 8 to 13, 1915, (F. E. Lutz; beating), 1 ♂, 2 ♀, 1 juv., [Am. Mus. Nat. Hist.].

Manati, San Juan, Porto Rico, VI, 27 to 29, 1915, (Lutz and Mutehler; at automobile headlights), 3 ♂, [Am. Mus. Nat. Hist.].

Baños de Coamo, Ponce, Porto Rico, VI, 5 to 7, IX, XII, 27, 1914 and 15, (Crampton, Mutehler and S. Morgan), 1 ♂, 2 ♀, [Am. Mus. Nat. Hist.].

Rio Piedras, Humacao, Porto Rico, XII, 18, 1911, 1 ♂, [U. S. N. M.].

Stony Hill, St. Andrew Parish, Jamaica, X, 25, 1913, (Hebard; in leaves on leaf mould in hillside forest), 1 ♂, 3 ♀, [Hebard Cln.].

Rio Cobre near Bogwalk, St. Catharine Parish, Jamaica, X, 25, 1913, (Hebard; in leaves on leaf mould in hillside forest), 1 juv., [Hebard Cln.].

Montego Bay, St. James Parish, Jamaica, X, 28 to XI, 2, 1913, (Hebard; under debris on Cretaceous limestone sand near beach, in leaves and leaf mould in hillside forest), 6 ♂, 2 ♀, 1 juv., [Hebard Cln.].

Cariblatta craticula²⁰ new species (Pl. XI, figs. 4 and 5; Pl. XII, fig. 9.)

The present species is closely related to *C. punctulata*, differing from that species in the distinctive facial markings and in the male genitalia which show a maximum specialization of the type of subgenital plate found in that insect.

Type.—♂; Mayaguez, Porto Rico. July 24 to 29, 1914. (Lutz and Mutehler.) [American Museum of Natural History.]

Description of Type.—Size small, form slender. Maxillary palpi with third joint very elongate, fourth joint slightly shorter, fifth (distal) joint about three-quarters as long as fourth. Tegmina with cross-veinlets between discoidal sectors numerous but inconspicuous. Supra-anal plate very small, strongly transverse, very weakly produced, with distal margin broadly and very weakly convex. Subgenital plate with lateral margins moderately raised proximad; distinctly produced mesad, where, in distinct briefly separated sockets with ventral surface of plate there raised and convex, is situated on each side a brief knob-like protuberance which has its dorsal surface covered with minute chitinous spines directed mesad (these spines heavier than is normal in *C.*

²⁰ In allusion to the straight transverse bars of the face which suggest the bars of a gridiron (craticula).

punctulata); between these specialized styles the brief median portion of the plate is somewhat inset, but produced mesad in a very narrow cylindrical projection about three times as long as broad.²¹ Face markings distinctive.

Allotype.—♀; same data as type. [American Museum of Natural History.]

Description of Allotype.—Similar to type except in the following features. Supra-anal plate very small, strongly transverse, weakly produced, with distal margin broadly convex, showing scarcely any mesal emargination. Subgenital plate large, scoop-shaped, free margin proximo-laterad weakly convex, then even more weakly concave at base of cercus, thence as weakly convex to the produced apex, which is broadly rounded but slightly pinched due to the contour of the plate.

Measurements (in millimeters)

Mayaguez, Porto Rico.	Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
♂						
Type.....		8.9	2	2.7	8.9	2.4
Paratypes.....	(2)	8.5-8.7	2	2.7	8.8-9.2	2.4-2.5
♀						
Allotype.....		8.4	2	2.9	8.9	2.8
Paratype.....		8.9	2	2.8	9	2.6

The present very small series is constant in size, approximating the specimens of *punctulata* before us with longest tegmina, and shows little color variation as well.

Coloration.—Similar to the normal condition in *punctulata* except in the distinctive features of the facial pattern, which readily distinguish the present species from any other of the genus. Face pale with four straight transverse parallel dark brown bands; the first between the ventral portions of the eyes broad, the second between the weakly indicated ocellar spots much narrower, the third and fourth ventrad, but dorsad of the clypeal suture, narrow lines slightly less widely separated than the more dorsal is from the interocellar band. The picturing of the disk of the pronotum is distinct but not heavily defined, the tegmina are immaculate, while the limbs have at the bases of the heavier spines the dark brown flecks usually found in the species of the present genus.

²¹ In one male before us this projection is clearly somewhat malformed; it is much shorter than in the other specimens and the chitinous spines covering the dorsal surfaces of the styles have their apices interlocking above it.

It is clear that the *punctulata* unit shows various specializations in both coloration and structure of the male subgenital plate. After careful consideration of the considerable series of this complex before us, we are convinced that none of the different conditions developed by that species have as yet progressed far enough, or become sufficiently constant, to warrant the recognition of geographic races. On the other hand it is evident that *reticulosa*, *craticula* and *cuprea* have, with *punctulata*, all been derived from a common ancestor, but have reached distinctive and constant degrees of specialization fully worthy of specific distinctions. Of these *reticulosa* shows very marked color specialization, accompanied by slight changes in the male subgenital plate; *cuprea* shows differences in the same features but developed along wholly distinct lines, while *craticula* not only shows distinctive features of facial color pattern, but also the maximum condition of specialization of the type of male subgenital plate found in the species placed by us in the first group of the West Indian complex.

Specimens Examined: 7; 4 males, 2 females and 1 immature male.

Mayaguez, Porto Rico, IV, 3, 1912, (C. W. Hooker), 1 ♀, *paratype*, [U. S. N. M.]; VI, 21 to 23, 1915, (Lutz and Mutchler; at light), 3 ♂, *type*, *paratypes*, [Am. Mus. Nat. Hist.]; VII, 24 to 29, 1914, (H. G. Barber), 1 ♂, 1 ♀, *paratype*, *allotype*, [Am. Mus. Nat. Hist.].

Adjuntas, Aguadilla, Porto Rico, VI, 8 to 13, 1915, (A. J. Mutchler; beating in high altitude forest), 1 juv. ♂, [Am. Mus. Nat. Hist.].

Cariblatta lutea lutea (Saussure and Zehntner) (Pl. XIII, fig. 3.)
1893. *Ceratinoptera lutea* Saussure and Zehntner, Biol. Cent.-Amer., Orth., i, p. 48. [♂, ♀: Georgia; Louisiana.]

This insect, though being, with its geographic race, distinctive as the only species of the genus showing decided reduction in the organs of flight, is very closely related to *C. punctulata*. In fact the only diagnostic features besides those mentioned above are, the normally constant form of the median production of the male subgenital plate; the distinctly less slender form of the female and less produced subgenital plate, and in both sexes the buffy general coloration tinged with cinnamon (never olivaceous) to varying degrees. The male subgenital plate, though not more distinct from the typical condition found in *punctulatus* than are occasional specimens of that species showing abnormal features,²² is

²² See page 160, footnote 16.

constant in typical *lutea* in having the distal margin between the specialized styles rather broadly and weakly produced, the produced portion forming a strongly transverse rectangle.

The following features are found in a pair from Spring Creek, Georgia. ♂. Size small, form slender. Pronotum with point of greatest width distinctly caudad of the normal meso-caudal point in the species of the genus; caudal margin truncate, very weakly convex.²³ Tegmina moderately reduced, not quite reaching apex of abdomen, with four longitudinal discoidal sectors, the cross-veinlets very weakly defined.²⁴ Wings of equal length, reduced, the ulnar vein simple or forked, the intercalated triangle minute.²⁵ Supra-anal plate very small, strongly transverse, very weakly produced with distal margin very broadly convex and emargination weakly indicated mesad. Subgenital plate moderately produced, with lateral margins distinctly raised; styles weakly inset, these specialized as in *punctulata*; space between styles about one fourth of the free margin, this median portion symmetrically produced, truncate, the production transverse rectangulate and nearly three times as broad as long.²⁶

♀. Agrees with the male except in the following features. Form distinctly less slender. Tegmina and wings rather decidedly reduced and showing the resultant coincident reduction in the

²³ As we have found elsewhere in the Blattidae, tegminal reduction appears to be accompanied by a broadening of the pronotum, with a lessening of the convexity of the caudal margin and a coincident shifting caudad of the point of greatest pronotal width. The pronotal features given above show rather this adjustment than what might appear to the casual observer to be features separating the present species widely from the other members of the genus.

²⁴ These features are exactly as would be expected in such cases of tegminal reduction; where moderate reduction is found in the present species five to four discoidal sectors are present, where moderately decided to decided reduction occurs five to three, four being usual in females of the typical race, three being frequently found in both sexes of *lutea minima*.

²⁵ These features are exactly as would be expected in such cases of wing reduction.

²⁶ The Lakeland specimens show a tendency toward *lutea minima*; the male has this production only twice as broad as long.

number of vein branches.²⁷ Supra-anal plate very similar, but showing a small, short, but rather decided, median concavity on the distal margin. The subgenital plate is much as found in this sex of *punctulata* but distinctly less produced, the median portion of the caudal margin being broadly rounded and the plate at this point not pinched.

Measurements (in millimeters)

♂	Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
Southern Pines, North Carolina	(1)	7.7	1.9	2.7	6.3	2
Spring Creek, Georgia	(1)	7.8	2.1	2.8	5.6	2
Natchez, Mississippi	(1)	8	2.1	2.7	6.6	2.1
Ormond, Florida	(2)	5.8-6	1.8	2.6-2.7	5.2-5.4	—
Lakeland, Florida	(1)	8.1	2	2.6	5.6	2.1
♀						
Raleigh, North Carolina	(2)	7.4-8.7	2.2-2.3	2.9-3.1	5-5.7	2.2-2.3
Southern Pines, North Carolina	(4)	7.2-9.5	2.2-2.3	2.8-3.1	4.9-6	2-2.4
Spring Creek, Georgia	(4)	7.5-8.3	2.2-2.4	2.9-3	5.2-5.7	2.1-2.2
Jacksonville, Florida	(2)	8-9.2	2.3-2.6	3.6	5.2-5.3	2.3-2.6
Lakeland, Florida	(1)	7	2.3	3.2	4.9	2.2
Baños San Vicente, Cuba	(1)	8.2	2.3	3.2	6	2.6

The specimens from Lakeland, Florida, show a slight tendency toward *lutea minima*. It is very surprising to find a specimen from Cuba which is apparently in every way typical of *lutea lutea*.

Coloration.—Head cinnamon, seldom varying to cinnamon buff; rarely immaculate, usually with a broad transverse band of bister between the eyes and often a narrower concave band of the same between the ocellar spots, rarely a third similarly narrow concave

²⁷ But four females of *lutea lutea*, (two, Jacksonville and one, Lakeland, Florida; one, Baños San Vicente, Cuba), show very great wing reduction, these organs being vestigial in these.

We have scarcely any material of the species from central peninsular Florida, where intergradation with the geographic race *lutea minima* probably occurs, and where this condition in intermediate females is probably frequently encountered.

band is found on the face, while a fourth, more ventral similar but much suffused band is weakly indicated in a few specimens.²⁸ Pronotum with lateral margins transparent with a very faint brownish suffusion, disk ochraceous tawny, varying rarely to warm buff, with a very fine picturing of snuff brown to bister, these markings normally decided, their pattern exactly as in *punctulata*, in very rare examples of maximum recessive coloration they are almost obliterated. Tegmina transparent tinged with ochraceous tawny, rarely with ochraceous buff (recessive), the veins translucent and very slightly darker. Wings, when not vestigial, hyaline, very weakly iridescent. Abdomen with dorsum of general coloration, heavily maculate (except in recessive condition) with blackish brown, venter normally heavily maculate with suffused blackish brown mesad, this not extending to subgenital plate, rarely (except in males) entirely pale, ventral surface with a faintly suggested narrow median line of dark brown and lateral dots of the same on each segment (recessive), or ventral surface blackish brown with paler lateral margins and narrow distal margin of subgenital plate (intensive, female). Limbs pinkish cinnamon (intensive) to warm buff (recessive), frequently flecked at the bases of the heavier spines with dark brown.

The males before us are of average distinctly recessive, the females of average moderately intensive, coloration.

The known distribution of the present geographic race is defined by the records given below and that of one of the types from Louisiana. In the southeastern United States it occurs northward and westward as far as Roanoke Island and Raleigh, North Carolina; Swansea, South Carolina; Thompsons Mills, Macon and Warm Springs, Georgia, and Natchez, Mississippi. In peninsular Florida intergradation with *lutea minima* probably occurs in the south-central section, material from Lakeland being referable to *lutea lutea* but showing some tendency toward *lutea minima*. This latter race is confined in distribution to southern peninsular Florida and the Florida Keys.

²⁸ These features, produced by recession and intensification in color pattern, are similarly found in *punctulata*, but in that species the maximum of intensification shows further decided differences from the normal.

Outside of the United States, *lutea lutea* is known from the single example before us from Baños San Vicente, Pinar del Rio, Cuba.

Specimens Examined: 54; 10 males, 32 females, 7 immature males and 5 immature females.

Roanoke Island, North Carolina, VII, 25, (G. P. Englehardt), 1 ♀, [Bklyn. Inst.]

Raleigh, N. C., VI, 8, 1905, 1 ♀, [A. N. S. P.]; VI, 23, 1904, (C. S. Brimley; under rubbish), 1 ♀, [Hebard Cln.].

Fayetteville, N. C., IX, 9, 1911, (Rehn and Hebard; under dead oak leaves), 1 juv. ♂, [Hebard Cln.].

Southern Pines, N. C., VI, 17 to VII, 22, 1914 and 1915, (A. H. Manee), 1 ♂, 4 ♀, [Davis and Hebard Cln.]; XI, 22, 1915, (A. H. Manee), 1 juv. ♂, [Hebard Cln.].

Wrightsville, N. C., IX, 7, 1911, (Rehn and Hebard), 1 juv. ♀, [A. N. S. P.].

Swansea, South Carolina, VIII, 6, 1911, (F. Knab) 1 ♀, [U. S. N. M.].

Thompson's Mills, Georgia, (H. A. Allard), 2 ♂, 1 ♀, 1 juv. ♀, [U. S. N. M.].

Macon, Ga., VII, 31, 1913, (Rehn and Hebard; undergrowth of short-leaf pine and oak woods), 1 ♀, not retained.

Warm Springs, Ga., VIII, 9 and 10, 1913, (Rehn; beaten from undergrowth), 1 ♀, 1 juv. ♀, [Hebard Cln.].

Albany, Ga., VIII, 1, 1913, (Rehn and Hebard; under needles in long-leaf pine woods), 1 ♀, [Hebard Cln.].

Thomasville, Ga., XII, 31, 1902, (Hebard; in dead oak leaves), 3 juv. ♂, [Hebard Cln. and A. N. S. P.].

Spring Creek, Ga., VI, 7 to 23, 1911, (J. C. Bradley), 3 ♂, 5 ♀, [Ga. State Cln., A. N. S. P. and Hebard Cln.].

Isle of Hope, Ga. IX, 3, 1911, (Rehn and Hebard), 1 ♀, [Hebard Cln.].

St. Simon's Island, Ga., IV, 22 to V, 12, 1911, (J. C. Bradley), 2 ♀, [A. N. S. P. and Ga. State Cln.].

Billy's Island, Okefenokee Swamp, Ga., VI, 1912, (J. C. Bradley), 2 ♀, [Cornell Univ. and Hebard Cln.].

Suwannee Creek, Okefenokee Swamp, Ga., VIII, 28, 1911, (Rehn and Hebard), 1 ♀, [A. N. S. P.].

Jacksonville, Florida, (T. J. Priddey), 2 ♀, [Hebard Cln.].

Atlantic Beach, Fla., VIII, 25, 1911, (Hebard; under boxes lying on short grass), 1 juv. ♂, [Hebard Cln.].

St. Augustine, Fla., (C. W. Johnson), 1 ♀, [A. N. S. P.].

Ormond, Fla., III, 12 and 20, 1899, (W. S. Blatchley), 2 ♂, [A. N. S. P. and Hebard Cln.].

La Grange, Fla., IX, 10, 1913, (W. T. Davis), 1 ♀, [Davis Cln.].

Lakeland, Fla., VI, 8, 1912, XI, 8, 1911, (W. T. Davis), 1 ♂, 2 ♀, [A. N. S. P. and U. S. N. M.].

Carrabelle, Fla., IX, 2 and 3, 1915, (Rehn and Hebard; beaten from heavy scrub in damp spot of sand dune area and from high bush, *Ilex lucida*, fringing inland swampy areas), 2 ♀, [Hebard Cln. and A. N. S. P.].

River Junction, Fla., VIII, 31, 1915, (Rehn and Hebard), 1 juv. ♂, [Hebard Cln.].

Springhill, Mobile County, Alabama, VIII, 25, 1915, (Hebard; undergrowth in long-leaf pine woods), 1 ♀, [Hebard Cln.].

Natchez, Mississippi, VI, 15, 1909, (E. S. Tucker; at sugar), 1 ♂, [U. S. N. M.]; IX, 14, 1915, (Rehn; beaten from low oak on hills), 1 small juv. ♀, [Hebard Cln.].

Baños San Vicente, Pinar del Rio, Cuba, IX, 16 to 22, 1913, (F. E. Lutz; moderately moist place in pasture land on valley floor), 1 ♀, [Am. Mus. Nat. Hist.].

Cariblattea lutea minima new subspecies (Pl. XIII, fig. 4.)

This geographic race differs from typical *lutea* in the average smaller size; average paler and more yellowish buff, rather than distinctly cinnamon, tones of general coloration; more decided tegminal reduction, particularly in the male sex, in which these organs show fully as much reduction as in the female; apparently always vestigial wings, and the median production of the male subgenital plate being much narrower than in typical *lutea*, very small and subquadrate, slightly longer than broad.

Type.—♂; Miami, Florida. March 3, 1915. (M. Hebard.) [Hebard Collection, Type No. 418.]

Description of Type.—Size very small, form slightly more robust than is normal in typical *lutea*. Pronotum with point of greatest width at the latero-caudal angles, caudal margin nearly straight, truncate. Tegmina decidedly reduced, reaching only to base of seventh dorsal abdominal segment; with three longitudinal discoidal sectors (thus the median vein branches but once) and no cross-veinlets. Wings vestigial. Supra-anal plate as in typical *lutea*. Subgenital plate as in that race but with specialized styles slightly closer to each other and production of intervening portion of distal margin very small, subquadrate, very slightly longer than wide.

Allotype.—♀; Miami, Florida. March 14, 1916. (M. Hebard.) [Hebard Collection.]

Description of Allotype.—Similar to type but larger and distinctly more robust. Pronotum slightly broader, caudal margin straight, truncate. Tegmina and wings much as in type, except that dextral tegmen has four discoidal sectors. Supra-anal plate very small, strongly transverse, weakly produced, with distal margin showing a small, short, median concavity. Subgenital plate as in typical *lutea*.

Measurements (in millimeters)

♂	Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
South Bay, Florida....	(11)	7-7.7	1.9-2.1	2.8-2.9	4.4-5	1.9-2
Everglade, Florida....	(10)	6.2-6.6	1.8-2.1	2.7-2.9	4.1-4.3	1.9-2
Miami, Florida.....	Type	5.9	1.9	2.8	3.7	1.9
Miami, Florida.....	(1)	6.2	2	3.1	4	1.9
Long Key, Florida....	(4)	5.4-5.8	1.8-1.9	2.6-2.9	3.6-3.8	1.7-1.9
Key West, Florida....	(3)	6-6.5	1.9-2	2.7-2.9	3.8-3.9	1.8-1.9
♀						
South Bay, Florida....	(24)	7-8.8	2.2-2.3	2.9-3.3	4.5-4.7	2-2.2
Everglade, Florida....	(23)	6.2-8	2.2-2.3	2.8-2.9	4.1-4.7	1.9-2
Long Key, Florida....	(2)	6.5-7	2	2.7-3	3.8-3.9	1.8-1.9
Key West, Florida....	(4)	5.8-7.2	2-2.1	2.9-3	3.6-4	1.9

The flattening of the caudal margin of the pronotum is more pronounced in this race, which shows normally greater tegminal and wing reduction than does typical *lutea*.²⁹ The reduction in the discoidal sectors of the tegmina is also more decided, the number being normally three, rarely two or four, in the present series.

Specimens Examined: ³⁰ 118; 44 males, 65 females, 5 immature males and 4 immature females.

Punta Gorda, Florida, XI, 14 to 16, 1911, (W. T. Davis), 1 ♂, 1 ♀, [Davis Cln.].

Fort Myers, Fla., III, 29 to V, 20, 1912, (W. T. Davis), 2 ♂, 2 ♀, [Davis Cln.].

Citrus Center, Fla., V, 2, 1912, (W. T. Davis), 1 ♂, [Davis Cln.].

South Bay, Lake Okeechobee, Fla., IV, 30 to V, 2, 1912, (W. T. Davis), 11 ♂, 24 ♀, 1 juv. ♀, [Davis Cln.].

Marco, Fla., IV, 19, 1912, (W. T. Davis), 1 ♀, [Davis Cln.].

Everglade, Fla., IV, 5 to 13, 1912, (W. T. Davis), 10 ♂, 23 ♀, [A. N. S. P. and Hebard Cln.].

Chokoloskee, Fla., IV, 8, 1912, (W. T. Davis), 1 ♀, [Davis Cln.].

Miami, Fla., III, 4, 1916, (Hebard; Musa Isle, under dead petioles of cocoanut palm on sandy soil in grapefruit grove), 8 ♂, 5 ♀, *paratypes*, *allotype*, 2 juv. ♂; III, 8, 1915, (Hebard; Brickell's Hammock, on ground under luxuriant undergrowth in opening of forest), 1 ♂, *type*, [Hebard Cln.]; III, 20, 1910, (Hebard), 1 ♂, *paratype*, 1 juv. ♂, 1 juv. ♀, [Hebard Cln. and A. N. S. P.].

²⁹ See page 166, footnote 23.

³⁰ A portion of the material here recorded, has been previously recorded as *Ceratinoptera lutea*.

Virginia Key, Fla., III, 11, 1915, (Hebard; under dark water-soaked leaves in heavy red mangrove, *Rhizophora mangle*, swamp), 1 juv. ♂, [Hebard Cln.].

Homestead, Fla., III, 17 to 19, 1910, (Hebard), 1 ♂, *paratype*; VII, 10, 1912, (Hebard; under board in everglades), 1 ♂, *paratype*, [both Hebard Cln.].

Key Largo, Fla., III, 18, 1910, (Hebard), 1 ♀, *paratype*, [Hebard Cln.].

Long Key, Fla., III, 13 and 17, 1910, (Hebard; under dead petioles of coconut palm on moist ground), 4 ♂, 3 ♀, *paratypes*, 2 juv. ♂, 1 juv. ♀, [Hebard Cln. and A. N. S. P.].

Key West, Fla., I, 20, 1904, (Hebard), 1 ♂; III, 15 to 16, 1910, (Hebard; under boards, short grass in open), 1 ♂, 4 ♀, 1 juv. ♀; VII, 7, 1912, (Rehn and Hebard; leaf mould in jungle key scrub), 1 ♂, [all Hebard Cln. and A. N. S. P.].

Cariblatia cuprea³¹ new species (Pl. XI, figs. 6 and 7; Pl. XII, fig. 10.)

When compared with *C. punctulata*, the present species is found to differ in the stouter form, different coloration and character of color pattern, and in the male subgenital plate in slight differences of degree; in this last respect agreeing more nearly with *C. reticulosa*, a species otherwise even more widely separated. In general form, a decided resemblance is found to *C. punctipennis*, but, as the male sex of that species is unknown, its exact position can not be definitely determined.

Type.—♂; Stony Hill, St. Andrew Parish, Jamaica. October 25, 1913. (M. Hebard.) [Hebard Collection, Type No. 413.]

Description of Type.—Size small, form rather slender, appreciably more robust than *C. punctulata*. Maxillary palpi with third joint very elongate, fourth joint slightly shorter, fifth (distal) joint about two-thirds as long as fourth. Tegmina with cross-veinlets between discoidal sectors numerous but inconspicuous. Supra-anal plate very small, strongly transverse, very weakly produced, with distal margin very broadly convex and very weakly angulato-emarginate mesad. Subgenital plate moderately produced, laterad but little raised; distal margin convex, very slightly irregular, with scarcely any depression at styles, which are small rounded knobs distinctly wider than long, with dorsal surface heavily clothed with minute close set echinous spines; the portion of the distal margin between these distinctly less than a third of the whole and transverse.³² Coloration distinctive.

Allotype.—♀; same data as type. [Hebard Collection.]

Description of Allotype.—Agrees with type except in following features. Form very slightly more robust. Supra-anal plate very small, strongly transverse, weakly produced, with distal margin broadly convex but showing a brief but rather decided median concavity. Subgenital plate large, scoop-shaped,

³¹ In allusion to the general coloration of the insect, which is much more coppery than in the other species of the genus.

³² In one specimen before us a slight convexity of this median portion of the distal margin of the subgenital plate is apparent.

free margin proximo-laterad distinctly convex, then distinctly and broadly concave at base of cereus, thence distinctly convex to the produced apex, which is slightly pinched due to the contour of the plate.

		Measurements (in millimeters)					
Stony Hill, Jamaica.		Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
♂							
Type.....			8.2	2.1	3	9.7	2.8
Paratypes.....	(4)	7.8-8.4	2-2.3	2.8-3.1	9.2-9.8	2.6-2.8	
♀							
Allotype.....		9	2.3	3.2	9.9	2.8	
Paratypes.....	(4)	8.7-9.	2.3-2.4	3.1-3.2	9.6-9.7	2.7-2.8	

The present series shows scarcely any variation either in size or coloration.

Coloration.—Head pale ochraceous tawny, obscured between the eyes with prout's brown, ventrad of this on the face are two weakly defined, narrow, weakly concave, transverse bands of prout's brown; ocellar spots conspicuous, cream color. Pronotum with lateral margins transparent with a very weak brownish suffusion; disk pale ochraceous tawny, immaculate except for two rather widely separated mesal dots of prout's brown; caudal margin of pronotum narrowly suffused with prout's brown. Tegmina transparent, tinged with brownish which shows a very slightly more tawny cast than in the other species of the genus. Wings transparent, hyaline, moderately iridescent; veins translucent brownish. Limbs and underparts weak ochraceous-tawny; the abdomen with a narrow submarginal line on each side of prouts brown, a dot of this color on each segment near the inner margin of this line. Limbs immaculate.

Specimens Examined: 11; 5 males, 5 females and 1 immature individual.

Stony Hill, St. Andrew Parish, Jamaica, X, 25, 1913, (Hebard; in leaves on leaf-mould in hillside forest), 5 ♂, 5 ♀, *type, allotype, paratypes*, 1 juv., [Hebard Cln.].

Cariblatta punctipennis new species

(Pl. XII, figs. 11 to 13.)

As the male of this species is unknown, it can not be placed with as much certainty as the other species here discussed. The species in general form agrees best with *C. cuprea*. The widely scattered but conspicuous dots, everywhere present on the

tegmina, are a condition found pronounced in no other species of the genus.³³

Type.—♀; Barbados. [Academy of Natural Sciences of Philadelphia, Type No. 5297.]

Description of Type.—Size and form very similar to *C. cuprea*. Maxillary palpi with third joint extremely elongate, fourth joint slightly shorter, fifth (distal) joint over two-thirds as long as fourth. Tegmina with cross-veinlets between discoidal sectors numerous and but weakly defined, except in area of dextral tegmen concealed when at rest, where they are well developed. Rather widely scattered dots on tegmina situated on veins everywhere over exposed surfaces when at rest, under binocular microscope each is found to constitute the base for a minute but stout hair. Supra-anal plate very small, strongly transverse, very weakly produced, with distal margin very broadly convex and with a rather broad and shallow concave emargination mesad. Subgenital plate large, scoop-shaped, distal margin distinctly convex proximo-laterad, then distinctly but broadly concave at base of cercus, thence distinctly convex to the produced apex which is pinched due to the contour of the plate.

Measurements (in millimeters)

♀	Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
Barbados, <i>type</i>		7.8	2.4	3	9.3	2.8
Long Ditton, Dominica <i>paratype</i>		7.9	2.3	3	9.6	2.9
Laudet, Dominica <i>para-</i> <i>types</i> (3)	8.3-9.2	2.3-2.4	3	3-3.1	8.7-9.8	2.9-3.1

Coloration.³⁴—Head entirely honey yellow (recessive), with a brownish suffusion between the eyes and traces of apparently vertical lines ventrad on the face of the same color (intensive). Pronotum with lateral margins transparent with a very weak brownish suffusion (recessive); suffusion buffy and more decided than in any other species of the genus (intensive). Disk of pronotum chamois, with a very few dots of prout's brown (recessive); or dots numerous and a cinnamon brown suffusion present (intensive). Tegmina transparent tinged with brownish, with all portions visible when at rest showing rather widely scattered

³³ Similar dots are present on the tegmina of Brunner's *Phyllodromia conspersa*, an aberrant South American member of the genus *Neoblattella*, which, however, shows no divergence toward the present complex.

³⁴ The type represents the extreme of recessive coloration found in the present small series.

dots of prout's brown. Wings hyaline, moderately iridescent; veins translucent brownish. Limbs and underparts immaculate warm buff (recessive); limbs with minute dots of blackish brown at base of each larger spine, abdomen with a heavy proximomesal maculation and dots laterad on each segment of the same color, but subgenital plate immaculate (intensive).

Specimens Examined: 5; 5 females.

Long Ditton, Dominica, VI, 20, 1911, (Crampton and Lutz), 1 ♀, *paratype*, [Am. Mus. Nat. Hist.].

Laudet, Dominica, VI, 11 to 13, 1911, (Crampton and Lutz), 3 ♀, *paratypes*, [Am. Mus. Nat. Hist. and Hebard Cln.].

Barbados, 1 ♀, ³⁵ *type*, [A. N. S. P.].

Cariblatta insularis (Walker) (Pl. XI, figs. 8 to 12; Pl. XII, figs. 14 to 16.)

1868. *Blatta insularis* Walker, Cat. Blatt. Br. Mus., p. 101. [♀, Jamaica..

1893. *Theganopteryx* (*Pseudectobia*) *antiguensis* Saussure and Zehntner) Biol. Cent.-Amer., Orth., i, p. 17. (In part ?) [♀, Antigua; ♀, Cuba.]

The description of *antiguensis* leaves no doubt that it belongs to the present genus,³⁶ and the material from Antigua is described as having the markings near the bases of the humeral and anal veins of the tegmina, which constitute a feature readily distinguishing the present species from any other of the present complex. The brief description of the Cuban female as a variety of *antiguensis*, is too short and indefinite to reveal any diagnostic features of value; the likelihood is that it represents an example of *C. punctulata*.

In general appearance the present insect suggests *C. punctulata*, but upon closer examination it is seen to be very widely separated from that species, differing in striking features of color pattern of which the cephalic markings and proximal maculations of the tegmina are distinctive from any other species of the genus, as is also the form of the male subgenital plate and of the styles.

The following features are as found in a pair from Montego Bay, Jamaica. ♂. Size small, form slender. Cross-veinlets between discoidal sectors of tegmina numerous but inconspicuous. Supra-anal plate similar to that of *C. punctulatus*. Subgenital

³⁵ This specimen has been incorrectly recorded by Rehn as a male of "*Blattella*" *conspersa* (Brunner). Ent. News, XVI, p. 175. (1905).

³⁶ The species has already been referred to the genus *Phyllodromia* by Sheldford. Ann. Mag. Nat. Hist., (7), xix, p. 36, (1907).

plate moderately produced, the lateral portions bent strongly upward leaving lateral margins dorsal in position; the short remaining median portion projecting caudad beneath the lateral portions which, curving mesad, nearly meet above it. This short median portion has the distal margin briefly curved upward and nearly transverse. At the base of the sinistral cleft between the lateral and mesal portions, is situated a chitinous thorn, curving regularly upward with sharp apex adjacent to the apex of the sinistro-lateral portion; at the base of the dextral cleft, is situated a rounded knob, slightly wider than long, with dorsal surface covered with small chitinous spines.³⁷ The form of the subgenital plate is symmetrical and is such that with the supra-anal plate, when in normal position, the specialized styles are almost hidden and the anal orifice nearly closed.

♀. Agrees with male except in the following features. Form very slightly less slender. Supra-anal plate very small, strongly transverse, weakly produced, with distal margin broadly convex but showing a rather broad, shallow median concavity. Subgenital plate similar to that of *punctulata* but with distal median portion somewhat wider.³⁸

Measurements (in millimeters)						
♂	Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
Montego Bay, Jamaica	(11)	7.7-8.3	1.8-2.1	2.7-2.9	8-9	2.3-2.6
♀						
Montego Bay, Jamaica	(9)	8-9.4	1.8-2.1	2.9-3	8.3-8.9	2.7-2.8

Coloration.—Head with vertex dark mummy brown to near point of narrowest interocular space, thence a large cream colored marking extends nearly to base of the antennae and is terminated ventrad by four rounded projections, its form thus resembling an inverted crown,³⁹ ventrad this is mummy brown with a median

³⁷ It is evident that these projections represent the styles in this distinctive species; the sinistral being of a type found nowhere else in the genus, but the dextral is similar to those found in *reticulosa*, *punctulata* and *cuprea*.

³⁸ Females of the species are more readily separated by the distinctive features of coloration rather than by structural characters.

³⁹ The lateral projections of this inverted crown are in part formed by the cream colored ocellar spots, this fusion making the latter inconspicuous.

dot and an indistinct transverse line of cinnamon-buff to the clypeus, which is of the paler coloration. Pronotum with lateral margins transparent with a brownish tinge; disk saccardo's umber with a few points of darker brown and numerous dots and lines of buffy, the caudal margin often narrowly suffused with bister. The pattern suggests that of *punctulata* but, as the darker coloring is more diffuse, the paler portions appear as dots and dashes rather than as the ground color. Tegmina transparent clear tawny olive with small elongate dark brown maculations, one at base of the anal vein, the other slightly distad on the discoidal vein.⁴⁰ Wings hyaline, moderately iridescent; veins almost colorless. Abdomen cinnamon buff with a few lateral indistinct maculations of darker brown. Limbs pale cinnamon buff, the tibiae at the bases of the spines frequently flecked with darker brown.

Specimens Examined: 22; 11 males, 9 females, 2 immature individuals.

Montego Bay, St. James Parish, Jamaica, III, 19, 1911, (J. A. Grossbeck; beating shrubbery), 1 ♀, [Am. Mus. Nat. Hist.]; X, 29 to XI, 3, 1913, (Hebard; moderately numerous and the most frequent Orthopteron encountered in bromeliads growing on the limbs of trees), 11 ♂, 8 ♀, 2 juv., [Hebard Cln. and A. N. S. P.].

Caribblatta fossicauda⁴¹ new species (Pl. XI, figs. 13 to 17, Pl. XII, figs. 17 and 18.)

In general appearance the present insect is almost identical with *C. aediculata* and further closely resembles *C. imitans*. Like in each of those species, however, the male genitalia are entirely different from those of any other species of the genus. When compared with *aediculata*, the present species is seen to be slightly smaller and less robust; the maxillary palpi are not as elongate; the tegmina and wings are shorter and the latter proportionately decidedly wider, not as clearly hyaline, with veins and veinlets more decided. In the female, the supra-anal plate shows no distinct mesal notch and the subgenital plate is less produced, with distal portion not roundly truncate.

Though in appearance one of the most inconspicuous species of the genus, the male subgenital plate shows the greatest specialization found in *Caribblatta*.

⁴⁰ These markings, though varying somewhat in intensity, are present in every specimen before us and represent a feature peculiar to the present species.

⁴¹ In allusion to the singular channels (fossa) of the male subgenital plate.

Type.—♂, Caparo, Trinidad. August, 1913. (S. M. Klages.)
[Hebard Collection, Type No. 415.]

Description of Type.—Size small, form rather slender, slightly more so than in *C. aediculata*. Maxillary palpi as in *C. imitans*, with fifth (distal) joint about three-quarters as long as fourth. Tegmina with numerous cross-veinlets between discoidal sectors weakly indicated, except in portion of dextral tegmen concealed when at rest. Supra-anal plate very small, transverse, distinctly but not strongly triangularly produced with apex rounded. Subgenital plate with dextral surface convex and curving inward above sinistral portion; sinistral portion strongly and narrowly produced sinistrad, with lateral margins parallel and ventral surface transversely convex, this production truncate distad with angles rounded; adjacent to this production dextrad is another lesser production, with lateral margins convergent and ventral surface transversely convex, this briefly truncate disto-sinistrad and briefly and roundly produced disto-dextrad. The greater portion of the plate is occupied by these two channeled processes. Within the apex of the sinistral production lies normally concealed a rather thin circular disk, with free margin thickly clothed with microscopic chitinous spines arranged in a whorl; within the niche formed by the distal truncate portion of the dextral process lies normally concealed a rather thin but moderately broad projection, longer than broad, with apex clothed with minute chitinous spines.

Allotype.—♀; same data as type. [Hebard Collection.]

Description of Allotype.—Agrees with the male sex except in the following features. Form very slightly more robust. Tegmina very slightly shorter. Supra-anal plate very small, strongly transverse, weakly produced, with distal margin nearly transverse in greater part, this margin weakly convex laterad and very weakly emarginate mesad. Subgenital plate large but not as large as in the majority of the species of the genus, scoop-shaped, distal margin proximo-laterad decidedly convex, then as decidedly concave at base of cercus, thence moderately convex to the moderately produced apex which is somewhat obtuse-angulate emarginate, the apex being distinctly less produced than in *aediculata*.

		Measurements in (millimeters)					
Caparo, Trinidad.		Number of specimen	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
♂							
Type.....			8.3	2	2.7	8.7	2.6
Paratypes.....	(24)	8.3-9.5	1.9-2	2.6-2.8	8-9	2.3-2.7	
♀							
Allotype.....			9.4	2.2	2.8	8.1	2.7
Paratypes.....	(15)	8.8-10.2	2.1-2.3	2.7-2.9	8.3-9	2.4-2.7	

Coloration.—Head with vertex and face tawny olive, ventrad between eyes a broad weakly defined band of bistre, ventrad of this a narrower, concave, weakly defined band of the same color between the ocellar spots and on the face two very narrow, mesally

interrupted, transverse bands of this color, (a slightly obscured type of the normal color pattern for the genus, see p. 155, footnote 10). Pronotum with lateral margins transparent with a brownish tinge; disk warm buff with picturing of minute lines of dresden brown and dots of mummy brown; form of colored portion of pronotum more noticeably octagonal than usual but with angles blunted. Tegmina transparent tinged with brownish; the veins pale, but the cross-veinlets dresden brown. Wings hyaline, with a weak iridescence; veins and distal cross-veinlets weakly brownish. Ventral surface of abdomen pinkish buff; ♂, with a suffused dark brown maculation at the apex of the caudal trochanter, sometimes this is almost wholly absent (recessive), while rarely it becomes a diffused band which is broad and heavy proximad, but very narrow and much broken distad (intensive); ♀, with a suffused dark brown blotch at the base of the caudal trochanter. Limbs warm buff, sometimes with minute flecks of brown at the bases of the heavier spines.

Specimens Examined: 42; 25 males and 17 females.

Caparo, Trinidad, VI, 1913, (S. M. Klages), 1 ♂, *paratype*, [A. N. S. P.]; VIII, 1913, (S. M. Klages), 24 ♂, 17 ♀, *type, allotype, paratypes*, [Hebard Cln.].

Caribblatta aediculata⁴² new species (Pl. XI, figs. 18 and 19; Pl. XII, figs. 19 and 20.)

Individuals of the present species, though in general appearance suggesting only unusually large examples of *C. fossicauda*, may be readily separated by a number of excellent diagnostic characters, as given under that species. The form of the male subgenital plate and particularly its appendages, are distinctive.

Type.—♂; Caparo, Trinidad. August, 1913. (S. M. Klages.) [Hebard Collection, Type No. 414.]

Description of Type.—Size small, form but moderately slender, very much as in *C. imitans*. Maxillary palpi slightly longer than in *imitans*, with fifth (distal) joint slightly more than two-thirds as long as fourth joint.⁴³ Tegmina with numerous cross-veinlets between discoidal sectors distinct in distal part of sinistral tegmen and in portion of dextral tegmen concealed when at rest, fully as decided as in *imitans*. Supra-anal plate very small, transverse, weakly produced, with lateral margins weakly convex and with a very weak

⁴² In allusion to the niches (aediculae) formed by the distal margin of the subgenital plate, in each of which are situated two appendages.

⁴³ In several specimens of the present species before us, the maxillary palpi, at least on one side, show varying degrees of deformity, the joints in such cases being sometimes distinctly less elongate than is normal.

median emargination. Subgenital plate with free margin proximo-laterad very briefly straight and horizontal, then abruptly and sharply declivent, thus rectangulate at the base of the cercus; bearing ventrad of the base of the cercus a small, smooth, stout finger with its external surface concave and rounded apex supplied with several minute chitinous spines, and immediately ventrad of this a minute, conical style with apex very sharply rounded; the entire distal portion of this margin is produced beyond this point with acute angulate, slightly divergent projections which extend slightly beyond the apices of the styles; the median portion of the margin is transverse.

Allotype.—♀; same data as type. [Hebard Collection.]

Description of Allotype.—Agrees with type except in the following features. Form somewhat more robust. Tegmina proportionately shorter than in male, not as much so as in *imitans*. Supra-anal plate very small, strongly transverse, weakly produced, with distal margin weakly triangularly produced with apex rather narrowly but decidedly rotundato-emarginate. Subgenital plate large, scoop-shaped; free margin proximo-laterad decidedly convex, then distinctly but not as strongly concave at base of cercus, thence convex to an equal degree to the decidedly produced apex.

		<i>Measurements (in millimeters)</i>					
Caparo, Trinidad.		Number of specimens	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
♂							
<i>Type</i>			8.6	2.3	3	10.3	3
<i>Paratypes</i>	(3)		9.2-9.7	2.3-2.4	3-3.1	9.6-10	3-3.1
♀							
<i>Allotype</i>			10.9	2.7	3.2	9.4	2.9
<i>Paratypes</i>	(5)		9.8-10.8	2.6-2.7	3.2-3.4	8.9-9.7	2.9-3.1

Coloration.—Almost identical with that of *C. fossicauda*, excepting that in both sexes the markings of the ventral surface of the abdomen are as heavy normally, as in the maximum condition of intensive coloration in that species, sometimes being distinctly more extensive, that of the female occasionally reaching to the base of the subgenital plate.

Specimens Examined: 11; 5 males and 6 females.

Caparo, Trinidad, VI, 1913, (S. M. Klages), 1 ♂, *paratype*, [A. N. S. P.]; VIII, 1913, (S. M. Klages), 4 ♂, 6 ♀, *type, allotype, paratypes*, [Hebard Cln.].

Cariblatta imitans new species (Pl. XI, fig. 20; Pl. XII, fig. 21.)

In general appearance this species closely resembles *C. fossicauda* and *C. aediculata* but with the inconspicuous color pattern of head and pronotum somewhat obscured. The species is distinctive in the genus in having the male subgenital plate simply formed and bearing two unspecialized styles.

Type.—♂; Corozal, Canal Zone, Panama. November 17, 1913. (M. Hebard.) [Hebard Collection, Type No. 412.]

Description of Type.—Size small, form but moderately slender, with *C. aediculata* representing the stoutest condition found in the genus. Maxillary palpi with third and fourth joints very elongate, fifth (distal) joint about two-thirds as long as fourth. Tegmina with cross-veinlets between discoidal sectors numerous and distinct, particularly in portion of dextral tegmen concealed when at rest, more so than in any other species of the genus except *C. reticulosa* and *C. aediculata*. Supra-anal plate very small, distinctly but not strongly triangularly produced. Subgenital plate moderately produced and but little raised toward distal margin, this margin with lateral portions very weakly concave to mesal third, at this point on each side the margin is very briefly notched, from which emargination on each side springs a minute simple cylindrical style, about four times as long as broad, with apex narrowly rounded; between these styles the median fourth of the margin is transverse with a very weak suggestion of bilobation.

Allotype.—♀; same data as type. [Hebard Collection.]

Description of Allotype.—Agrees with type except in following features. Form distinctly more robust. Tegmina proportionately distinctly shorter. Supra-anal plate very small, strongly transverse, weakly produced, with distal margin showing a slight median emargination, which gives a general weakly bilobate outline. Subgenital plate large, scoop-shaped, much as in *aediculata*, more produced than in *C. punctulata*.

Measurements (in millimeters)

Corozal, Panama.	Length of body.	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
♂					
<i>Type</i>	8.8 ⁴⁴	2.3	2.9	9.5	2.8
<i>Paratype</i>	8	2.2	2.8	9.4	2.7
♀					
<i>Allotype</i>	10.5	2.4	3.2	8.7	2.6
<i>Paratype</i>	10.3	2.4	3.2	8.8	2.7

Coloration.—Head with vertex mikado brown, ventrad between the eyes clouded with warm sepia; ventrad of the antennal sockets pinkish cinnamon, shading to buffy toward the clypeus. Pronotum with lateral margins transparent with a brownish tinge; disk warm buff faintly washed to varying degrees in the specimens before us with ochraceous tawny, with numerous obscured markings (of the pattern of the pencilling and dots in *aediculata* but more obscured and recessive) of darker brown (in individuals

⁴⁴ The abdomen of this specimen has been squeezed out about half a millimeter beyond its probable normal length.

before us as russet to ochraceous-tawny and prout's brown). Tegmina transparent tinged with brownish; the veins slightly darker, the distal cross-veinlets conspicuous tawny-olive. Wings hyaline, not iridescent; veins and numerous distal cross-veinlets tawny-olive. Antennae, limbs and ventral surface of abdomen warm buff, the latter with a proximal medio-longitudinal suffusion of dark brown. Limbs with traces of minute darker flecks at bases of heavier spines.

Specimens Examined: 4; 2 males and 2 females.

Corozal, Canal Zone, Panama, XI, 17, 1913, (Hebard; among loose leaves lying on leaf-mould in heavy jungle), 2 ♂, 2 ♀, *type, allotype, paratypes*, [Hebard Chn.].

EXPLANATION OF PLATES

Plate XI

Supra-anal and subgenital plates greatly enlarged. Genital appendages highly magnified.

- Fig. 1.—*Cariblatta reticulosa* (Walker). ♂. Stony Hill, Jamaica. Ventral view of subgenital plate.
- Fig. 2.—*Cariblatta punctulata* (Beauvois). ♂. San Francisco Mountains, San Domingo. Ventral view of subgenital plate.
- Fig. 3.—*Cariblatta punctulata* (Beauvois). ♂. J  sus del Monte, Cuba. Concealed genital hook (termed titillator penis by Shelford).
- Fig. 4.—*Cariblatta craticula* new species. ♂, *type*. Mayaguez, Porto Rico. Ventral view of subgenital plate.
- Fig. 5.—*Cariblatta craticula* new species. ♂, *type*. Ventro-caudal view of subgenital plate.
- Fig. 6.—*Cariblatta cuprea* new species. ♂, *type*. Stony Hill, Jamaica. Ventral view of subgenital plate.
- Fig. 7.—*Cariblatta cuprea* new species. ♂, *type*. Specialized style. This type found also in *reticulosa*, *punctulata* and *craticula*.
- Fig. 8.—*Cariblatta insularis* (Walker). ♂. Montego Bay, Jamaica. Ventral view of subgenital plate.
- Fig. 9.—*Cariblatta insularis* (Walker). ♂. Montego Bay, Jamaica. Caudal view of subgenital plate with specialized styles visible.
- Fig. 10.—*Cariblatta insularis* (Walker). ♂. Montego Bay, Jamaica. Sinistral specialized style.
- Fig. 11.—*Cariblatta insularis* (Walker). ♂. Montego Bay, Jamaica. Dextral specialized style.
- Fig. 12.—*Cariblatta insularis* (Walker). ♂. Montego Bay, Jamaica. Concealed genital hook.
- Fig. 13.—*Cariblatta fossicauda* new species. ♂, *type*. Caparo, Trinidad. Ventral view of subgenital plate.
- Fig. 14.—*Cariblatta fossicauda* new species. ♂, *type*. Caparo, Trinidad. Ventro-caudal view of subgenital plate.
- Fig. 15.—*Cariblatta fossicauda* new species. ♂, *type*. Caparo, Trinidad. Dorsal view of supra-anal plate. This type is found throughout the genus.
- Fig. 16.—*Cariblatta fossicauda* new species. ♂, *paratype*. Caparo, Trinidad. Dextral concealed specialized style.
- Fig. 17.—*Cariblatta fossicauda* new species. ♂, *paratype*. Caparo, Trinidad. Sinistral concealed specialized style.
- Fig. 18.—*Cariblatta aediculata* new species. ♂, *type*. Caparo, Trinidad. Ventral view of subgenital plate.
- Fig. 19.—*Cariblatta aediculata* new species. ♂, *type*. Caparo, Trinidad. Ventro-caudal view of subgenital plate.
- Fig. 20.—*Cariblatta imitans* new species. ♂, *type*. Corozal, Panama. Ventral view of subgenital plate.

Plate XII

Figures greatly enlarged

- Fig. 1.—*Cariblatia reticulosa* (Walker). ♂. Stony Hill, Jamaica. Cephalic view of head.
- Fig. 2.—*Cariblatia reticulosa* (Walker). ♂. Stony Hill, Jamaica. Dorsal view of pronotum.
- Fig. 3.—*Cariblatia reticulosa* (Walker). ♂. Stony Hill, Jamaica. Dorsal view of sinistral tegmen.
- Fig. 4.—*Cariblatia punctulata* (Beauvois). ♂. San Francisco Mountains, San Domingo. Cephalic view of head.
- Fig. 5.—*Cariblatia punctulata* (Beauvois). ♂. San Francisco Mountains, San Domingo. Lateral outline of maxillary palpus.
- Fig. 6.—*Cariblatia punctulata* (Beauvois). ♂. San Francisco Mountains, San Domingo. Dorsal view of pronotum. (Moderately intensive color pattern.)
- Fig. 7.—*Cariblatia punctulata* (Beauvois). ♂. J  sus del Monte, Cuba. Dorsal view of pronotum. (Maximum recessive color pattern.)
- Fig. 8.—*Cariblatia punctulata* (Beauvois). ♀. San Francisco Mountains, San Domingo. Ventral outline of subgenital plate.
- Fig. 9.—*Cariblatia craticula* new species. ♂, *type*. Mayaguez, Porto Rico. Cephalic view of head.
- Fig. 10.—*Cariblatia cuprea* new species. ♂, *type*. Stony Hill, Jamaica. Dorsal view of pronotum.
- Fig. 11.—*Cariblatia punctipennis* new species. ♀, *type*. Barbados. Dorsal view of pronotum. (Maximum recessive color pattern.)
- Fig. 12.—*Cariblatia punctipennis* new species. ♀. Laudet, Dominica. Dorsal view of pronotum. (Intensive color pattern.)
- Fig. 13.—*Cariblatia punctipennis* new species. ♀, *type*. Barbados. Dorsal view of sinistral tegmen.
- Fig. 14.—*Cariblatia insularis* (Walker). ♂. Montego Bay, Jamaica. Cephalic view of head.
- Fig. 15.—*Cariblatia insularis* (Walker). ♂. Montego Bay, Jamaica. Dorsal view of pronotum.
- Fig. 16.—*Cariblatia insularis* (Walker). ♂. Montego Bay, Jamaica. Dorsal view of sinistral tegmen.
- Fig. 17.—*Cariblatia fossicauda* new species. ♂, *type*. Caparo, Trinidad. Lateral outline of maxillary palpus.
- Fig. 18.—*Cariblatia fossicauda* new species. ♂, *type*. Caparo, Trinidad. Dorsal view of pronotum.
- Fig. 19.—*Cariblatia adiculata* new species. ♂, *type*. Caparo, Trinidad. Lateral outline of maxillary palpus.
- Fig. 20.—*Cariblatia adiculata* new species. ♂, *type*. Caparo, Trinidad. Dorsal view of pronotum.
- Fig. 21.—*Cariblatia imitans* new species. ♂, *type*. Corozal, Panama. Dorsal view of pronotum.

Plate XIII

- Fig. 1.—*Caribblatta punctulata* (Beauvois). ♀. Adjuntas, Porto Rico. Showing maximum size and maximum development of organs of flight. (X $4\frac{1}{2}$)
- Fig. 2.—*Caribblatta punctulata* (Beauvois). ♂. San Francisco Mountains, San Domingo. Showing normal size and normal development of organs of flight. (X $4\frac{1}{2}$)
- Fig. 3.—*Caribblatta lutea lutea* (Saussure and Zehntner). ♂. Ormond, Florida. Showing normal size and normal development in this sex of organs of flight. (X $4\frac{1}{2}$)
- Fig. 4.—*Caribblatta lutea minima* new subspecies. ♂. Homestead, Florida. Showing normal size and extreme reduction in the species of the genus in the organs of flight. (X $4\frac{1}{2}$)

Explanation of diagram of fully developed tegmen and wing in *Caribblatta*.

1. Marginal Field. Marginal or Mediastine Field (Brunner); Mediastine Area (Saussure); Basal Area (Saussure and Zehntner); Mediastinal Area (Shelford).
 2. Scapular Field. Scapular Field (Brunner); Costal Area (Saussure). [1 and 2 termed Marginal Field (Saussure, Saussure and Zehntner); Marginal Area (Shelford).]
 3. Discoidal Field. Discoidal Field (Saussure, Saussure and Zehntner); Discoidal Area (Shelford).
 4. Anal Field. Anal Field (Brunner, Saussure, Saussure and Zehntner); Anal Area (Shelford).
 5. Anterior Field. Anterior Field (Saussure and Zehntner). [Portion to discoidal vein termed Marginal Field (Saussure).] [Portion between discoidal vein and first radiate vein termed Discoidal Field (Saussure).]
 6. Intercalated Triangle. Triangular Apical Field (Brunner); Intercalated or Reflexed Field (Saussure); Triangular Apical Area (Shelford).
 7. Posterior Field. Posterior Field (Saussure and Zehntner). [Portion included between axillary vein and its branches termed Intermediate or Axillary Field (Saussure and Zehntner).] [Portion included between radiate veins termed Anal Field (Brunner, Saussure); Posterior Field (Saussure); Radiate Field (Saussure and Zehntner).]
- Ms. Mediastine Vein. Mediastine Vein (Brunner; Saussure; Saussure and Zehntner); Mediastinal Vein (Shelford).
- D. Discoidal Vein. Scapular or Principal Vein (Brunner); Humeral Vein (Saussure); Discoidal Vein (Saussure and Zehntner); Radial Vein (Shelford).
- C. Costal Veins. Costal Veins of Authors.
- M. Median Vein. Median Vein (Brunner, Saussure, Saussure and Zehntner); Median or Ulnar Vein (Shelford).
- Mr. Branches of Median Vein. Rami of Median Vein (Saussure and Zehntner).

- U. Ulnar Vein. Infra-Median Vein (Brunner); Discoidal Vein (Saussure); Ulnar Vein (Saussure and Zehntner, Shelford). When two veins are found in wing between the median and anal veins these are termed Anterior Ulnar and Posterior Ulnar (Saussure and Zehntner, Shelford).
- A. Anal Vein. Anal Vein (Brunner (in tegmen only), Saussure, Shelford); Anal Sulcus (Saussure and Zehntner). In wing termed Dividing Vein (Brunner); Anal or Dividing Vein (Saussure and Zehntner, Shelford).
- Ax. Axillary Vein. In tegmen Axillary Veins of Authors. In wing Axillary Veins (Saussure and Zehntner, Shelford); including radiate veins, Axillary Nervures (Brunner).
- R. Radiate Veins. Radiate Veins (Saussure and Zehntner).